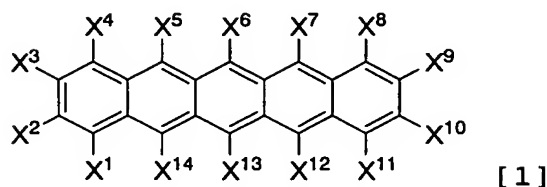


CLAIMS

[1] A compound represented by formula [1]

[Formula 1]



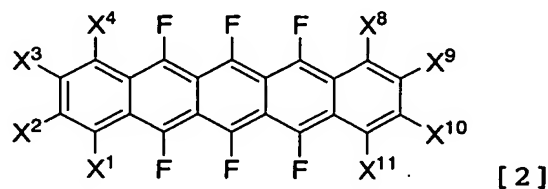
5 (wherein X¹, X², X³, X⁴, X⁵, X⁶, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², X¹³, and X¹⁴ represent fluorine, hydrogen, a substituted or unsubstituted C₁₋₈ alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X² is bonded to X³ to form a monocyclic or condensed polycyclic hydrocarbon group and/or

10 X⁹ is bonded to X¹⁰ to form a monocyclic or condensed polycyclic hydrocarbon group)

wherein the groups in at least one pair selected from the group consisting of the pair X⁵ and X¹⁴, the pair X⁶ and X¹³, and the pair X⁷ and X¹² are both fluorine.

20 [2] A compound represented by formula [2]

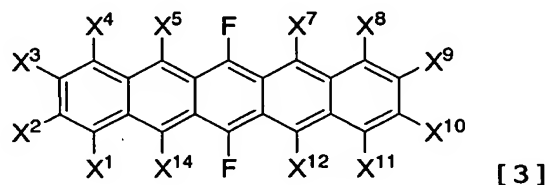
[Formula 2]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

[3] Formula [3]

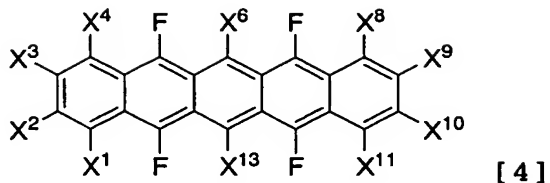
[Formula 3]



(wherein X^1 , X^2 , X^3 , X^4 , X^5 , X^7 , X^8 , X^9 , X^{10} , X^{11} , X^{12} , and X^{14} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

[4] Formula [4]

[Formula 4]

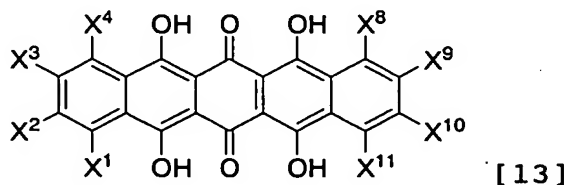


(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13}

5 represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group,
 10 or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

15 [5] A method of producing a compound represented by formula [13]

[Formula 7]

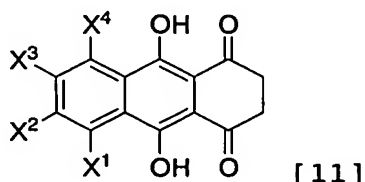


(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent
 20 fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted

or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or
5 condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group), comprising the step of

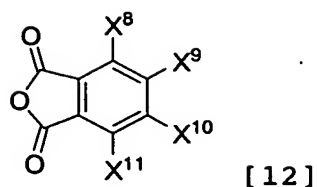
producing a compound represented by formula [13] by reacting a compound represented by formula [11]

10 [Formula 5]



(wherein X^1 , X^2 , X^3 , and X^4 represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or
15 unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or
20 condensed polycyclic hydrocarbon group) with a compound represented by formula [12]

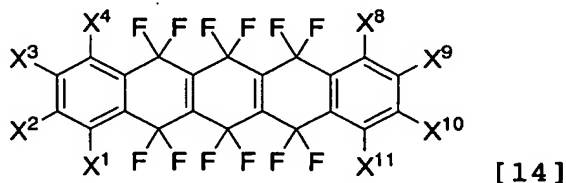
[Formula 6]



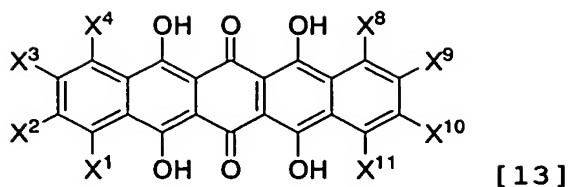
(wherein X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) in the presence of a Lewis acid.

[6] The production method according to claim 5, wherein the Lewis acid comprises aluminum chloride.

[7] A method of producing a compound represented by formula [14]
[Formula 9]



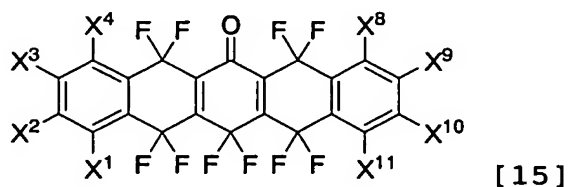
(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as for formula [13]), comprising the step of
producing a compound represented by formula [14] by reacting a compound represented by formula [13]
[Formula 8]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[8] A method of producing a compound represented by formula [15]

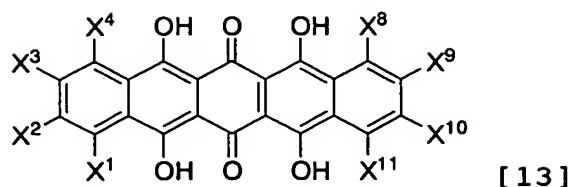
[Formula 11]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as for formula [13]), comprising the step of

producing a compound represented by formula [15] by reacting a compound represented by formula [13]

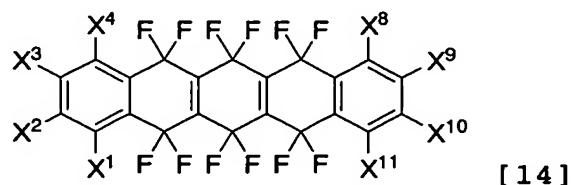
[Formula 8]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[9] A method of producing a compound represented by formula [14]

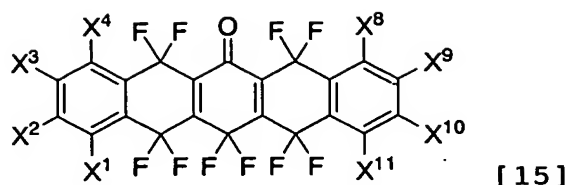
[Formula 13]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as for formula [15]), comprising the step of

producing a compound represented by formula [14] by reacting a compound represented by formula [15]

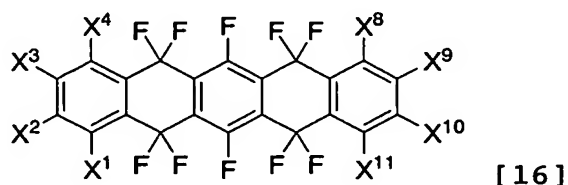
[Formula 12]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[10] A method of producing a compound represented by formula [16]

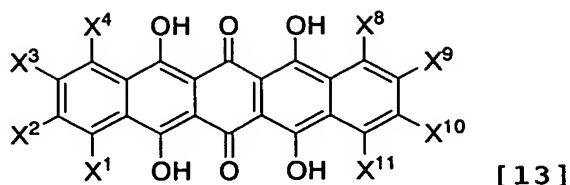
[Formula 15]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as for formula [13]), comprising the step of

producing a compound represented by formula [16] by reacting a compound represented by formula [13]

[Formula 14]

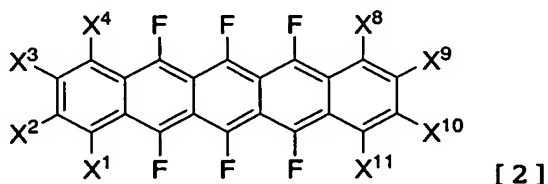


(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[11] The production method according to any of claims 7 to 10, wherein the fluorinating agent comprises sulfur tetrafluoride.

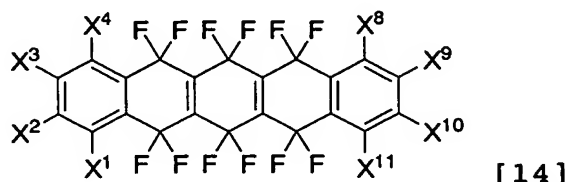
[12] A method of producing a compound represented by formula [2]

[Formula 17]



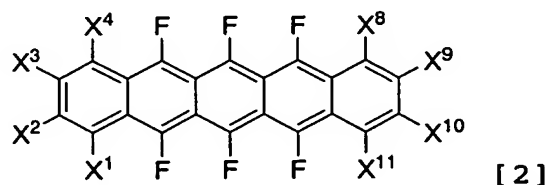
(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as for formula [14]), comprising the step of

producing a compound represented by formula [2] by
 reacting a compound represented by formula [14]
 [Formula 16]



- 5 (wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent
 fluorine, hydrogen, a substituted or unsubstituted C_{1-8}
 alkyl group, a substituted or unsubstituted phenyl group, a
 substituted or unsubstituted naphthyl group, a substituted
 or unsubstituted anthracenyl group, a substituted or
 10 unsubstituted naphthacenyl group, or a substituted or
 unsubstituted pentacenyl group, and may be the same or
 different; or X^2 is bonded to X^3 to form a monocyclic or
 condensed polycyclic hydrocarbon group and/or X^9 is bonded
 to X^{10} to form a monocyclic or condensed polycyclic
 15 hydrocarbon group) with a reducing agent.

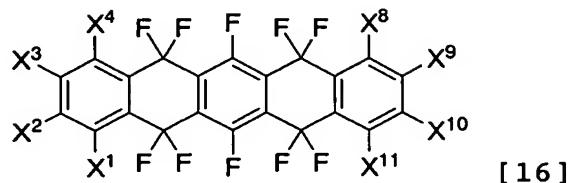
[13] A method of producing a compound represented by
 formula [2]
 [Formula 19]



- 20 (wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} are defined as
 for formula [16]), comprising the step of
 producing a compound represented by formula [2] by

reacting a compound represented by formula [16]

[Formula 18]

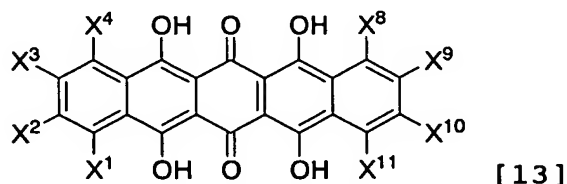


(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent
 5 fluorine, hydrogen, a substituted or unsubstituted C_{1-8}
 alkyl group, a substituted or unsubstituted phenyl group, a
 substituted or unsubstituted naphthyl group, a substituted
 or unsubstituted anthracenyl group, a substituted or
 unsubstituted naphthacenyl group, or a substituted or
 10 unsubstituted pentacenyl group, and may be the same or
 different; or X^2 is bonded to X^3 to form a monocyclic or
 condensed polycyclic hydrocarbon group and/or X^9 is bonded
 to X^{10} to form a monocyclic or condensed polycyclic
 hydrocarbon group) with a reducing agent.

15 [14] The production method according to claim 12 or 13,
 wherein the reducing agent comprises zinc, iron, copper,
 nickel, palladium, or a combination thereof.

[15] A compound represented by formula [13]

[Formula 20]

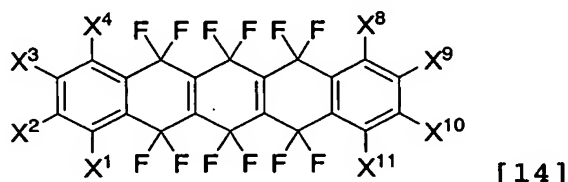


20

(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent
 fluorine, hydrogen, a substituted or unsubstituted C_{1-8}

alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

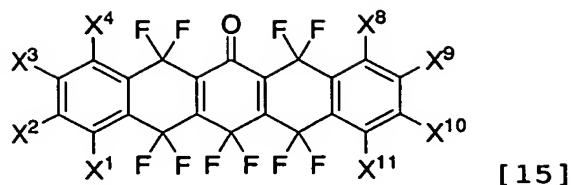
- 10 [16] A compound represented by formula [14]
[Formula 21]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8}

- 15 alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

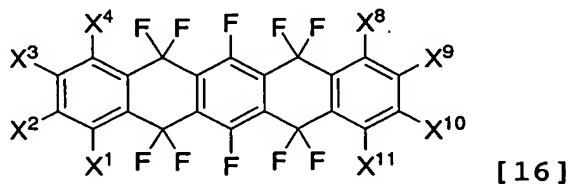
- [17] A compound represented by formula [15]
25 [Formula 22]



(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

[18] A compound represented by formula [16]

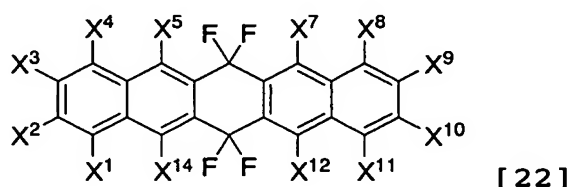
[Formula 23]



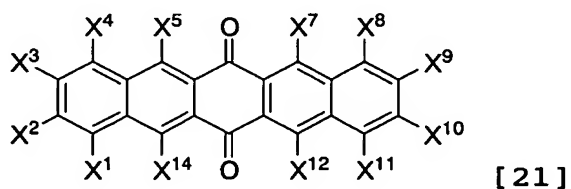
(wherein X^1 , X^2 , X^3 , X^4 , X^8 , X^9 , X^{10} , and X^{11} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or

different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

- 5 [19] A method of producing a compound represented by formula [22]
[Formula 25]



- (wherein X^1 , X^2 , X^3 , X^4 , X^5 , X^7 , X^8 , X^9 , X^{10} , X^{11} , X^{12} , and X^{14}
10 are defined as for formula [21]), comprising the step of
producing a compound represented by formula [22] by
reacting a compound represented by formula [21]
[Formula 24]



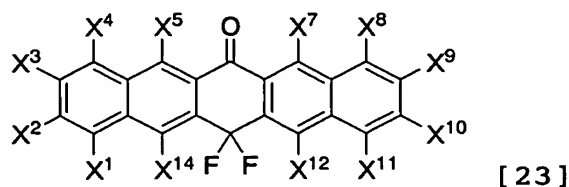
- 15 (wherein X^1 , X^2 , X^3 , X^4 , X^5 , X^7 , X^8 , X^9 , X^{10} , X^{11} , X^{12} , and X^{14}
represent fluorine, hydrogen, a substituted or
unsubstituted C_{1-8} alkyl group, a substituted or
unsubstituted phenyl group, a substituted or unsubstituted
naphthyl group, a substituted or unsubstituted anthracenyl
20 group, a substituted or unsubstituted naphthacenyl group,
or a substituted or unsubstituted pentacenyl group, and may
be the same or different; or X^2 is bonded to X^3 to form a

monocyclic or condensed polycyclic hydrocarbon group and/or X⁹ is bonded to X¹⁰ to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[20] A method of producing a compound represented by

5 formula [23]

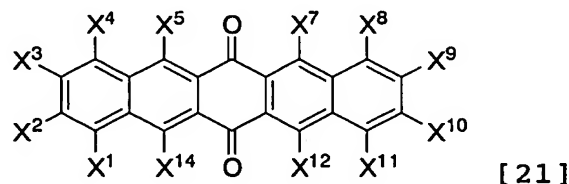
[Formula 27]



(wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴ are defined as for formula [21]), comprising the step of

10 producing a compound represented by formula [23] by reacting a compound represented by formula [21]

[Formula 26]



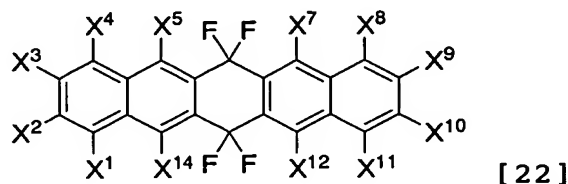
(wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴

15 represent fluorine, hydrogen, a substituted or unsubstituted C₁₋₈ alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, 20 or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X² is bonded to X³ to form a monocyclic or condensed polycyclic hydrocarbon group and/or

X⁹ is bonded to X¹⁰ to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[21] A method of producing a compound represented by formula [22]

5 [Formula 29]

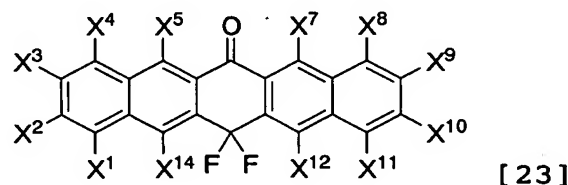


(wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴ are defined as for formula [23]), comprising the step of

producing a compound represented by formula [22] by

10 reacting a compound represented by formula [23]

[Formula 28]



(wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴ represent fluorine, hydrogen, a substituted or

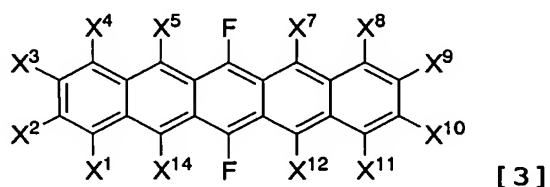
15 unsubstituted C₁₋₈ alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may
20 be the same or different; or X² is bonded to X³ to form a monocyclic or condensed polycyclic hydrocarbon group and/or X⁹ is bonded to X¹⁰ to form a monocyclic or condensed

polycyclic hydrocarbon group) with a fluorinating agent.

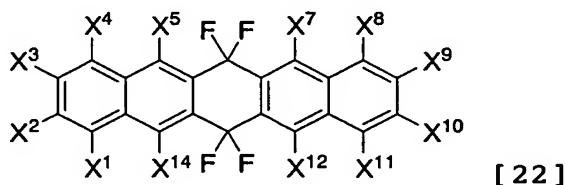
[22] The production method according to any of claims 19 to 21, wherein the fluorinating agent comprises sulfur tetrafluoride.

5 [23] A method of producing a compound represented by formula [3]

[Formula 31]



(wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴
 10 are defined as for formula [22]), comprising the step of
 producing a compound represented by formula [3] by
 reacting a compound represented by formula [22]
 [Formula 30]



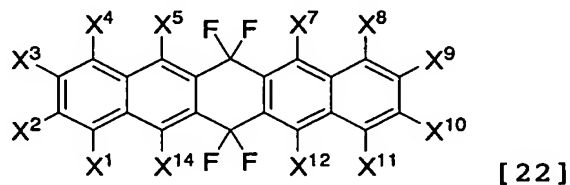
15 (wherein X¹, X², X³, X⁴, X⁵, X⁷, X⁸, X⁹, X¹⁰, X¹¹, X¹², and X¹⁴
 represent fluorine, hydrogen, a substituted or
 unsubstituted C₁₋₈ alkyl group, a substituted or
 unsubstituted phenyl group, a substituted or unsubstituted
 naphthyl group, a substituted or unsubstituted anthracenyl
 20 group, a substituted or unsubstituted naphthacenyl group,
 or a substituted or unsubstituted pentacenyl group, and may
 be the same or different; or X² is bonded to X³ to form a

monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a reducing agent.

[24] The production method according to claim 23, wherein
5 the reducing agent comprises zinc, iron, copper, nickel, palladium, or a combination thereof.

[25] A compound represented by formula [22]

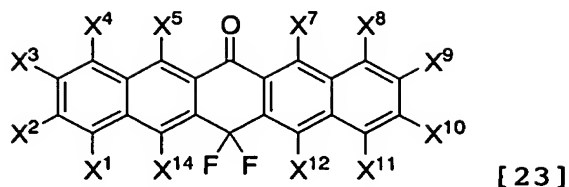
[Formula 32]



10 (wherein X^1 , X^2 , X^3 , X^4 , X^5 , X^7 , X^8 , X^9 , X^{10} , X^{11} , X^{12} , and X^{14} [?] represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl
15 group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed
20 polycyclic hydrocarbon group).

[26] A compound represented by formula [23]

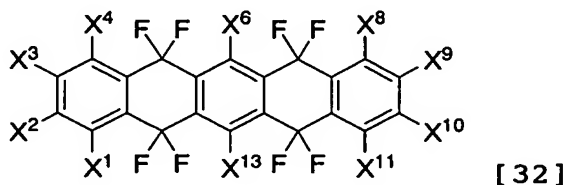
[Formula 33]



(wherein X^1 , X^2 , X^3 , X^4 , X^5 , X^7 , X^8 , X^9 , X^{10} , X^{11} , X^{12} , and X^{14} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group).

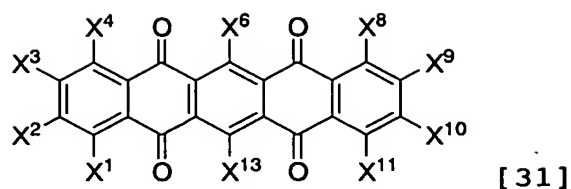
[27] A method of producing a compound represented by formula [32]

15 [Formula 35]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} are defined as for formula [31]), comprising the method of producing a compound represented by formula [32] by reacting a compound represented by formula [31]

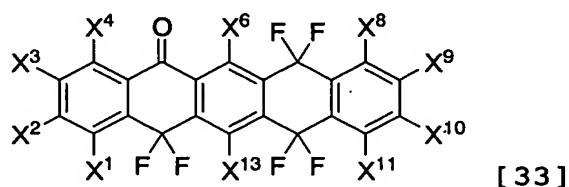
[Formula 34]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

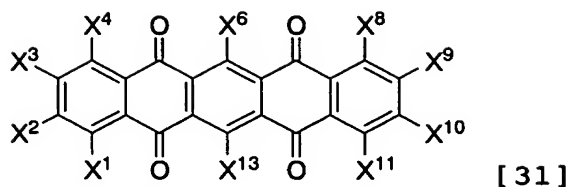
[28] A method of producing a compound represented by formula [33]

[Formula 37]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} are defined as for formula [31]), comprising the method of producing a compound represented by formula [33] by reacting a compound represented by formula [31]

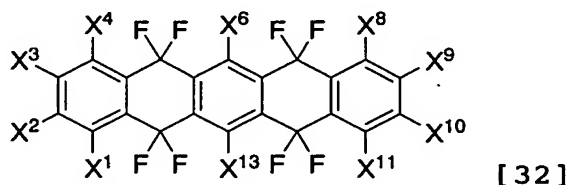
[Formula 36]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

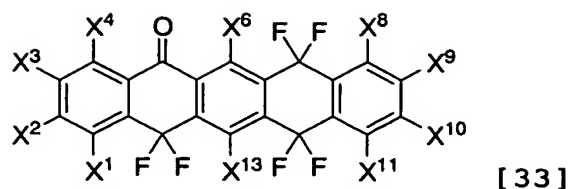
[29] A method of producing a compound represented by formula [32]

15 [Formula 39]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} are defined as for formula [33]), comprising the method of producing a compound represented by formula [32] by reacting a compound represented by formula [33]

20 [Formula 38]

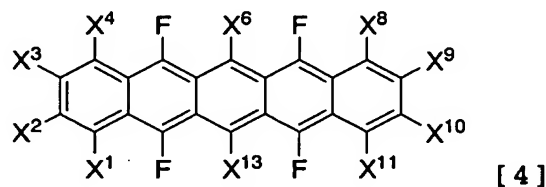


(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a fluorinating agent.

[30] The production method according to any of claims 27 to 29, wherein the fluorinating agent comprises sulfur tetrafluoride.

[31] A method of producing a compound represented by formula [4]

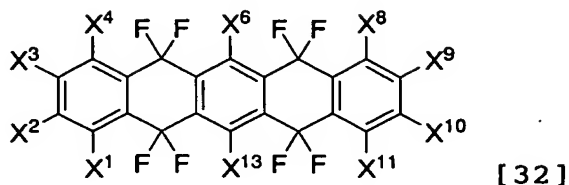
[Formula 41]



(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} are defined as for formula [32]), comprising the method of producing a compound represented by formula [4] by

reacting a compound represented by formula [32]

[Formula 40]



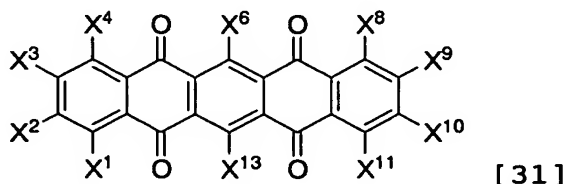
(wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13}

5 represent fluorine, hydrogen, a substituted or unsubstituted C_{1-8} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group,
 10 or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X^2 is bonded to X^3 to form a monocyclic or condensed polycyclic hydrocarbon group and/or X^9 is bonded to X^{10} to form a monocyclic or condensed polycyclic hydrocarbon group) with a reducing agent.

15 [32] The production method according to claim 31, wherein the reducing agent comprises zinc, iron, copper, nickel, palladium, or a combination thereof.

[33] A compound represented by formula [31]

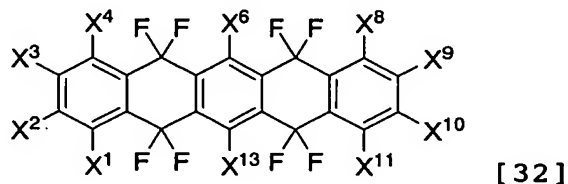
[Formula 42]



20 (wherein X^1 , X^2 , X^3 , X^4 , X^6 , X^8 , X^9 , X^{10} , X^{11} , and X^{13} represent fluorine, hydrogen, a substituted or

unsubstituted C₁₋₈ alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X² is bonded to X³ to form a monocyclic or condensed polycyclic hydrocarbon group and/or X⁹ is bonded to X¹⁰ to form a monocyclic or condensed polycyclic hydrocarbon group).

- 10 [34] A compound represented by formula [32]
[Formula 43]



(wherein X¹, X², X³, X⁴, X⁶, X⁸, X⁹, X¹⁰, X¹¹, and X¹³ represent fluorine, hydrogen, a substituted or

- 15 unsubstituted C₁₋₈ alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted anthracenyl group, a substituted or unsubstituted naphthacenyl group, or a substituted or unsubstituted pentacenyl group, and may be the same or different; or X² is bonded to X³ to form a monocyclic or condensed polycyclic hydrocarbon group and/or X⁹ is bonded to X¹⁰ to form a monocyclic or condensed polycyclic hydrocarbon group).
- 20